

## VEHICLE OCCUPANT CLASSIFICATION SYSTEM AND METHOD

### ABSTRACT OF THE DISCLOSURE

- 5        A vehicle occupant classification system classifies a vehicle occupant based on data from an array of sensors using a combination of weight estimation, pattern recognition, and evaluation of statistical characteristics. This occupant classification can then be used to make an airbag deployment state decision. The major modules of this system can include a calibration unit, a weight estimation module, a pattern module, and a decision-making
- 10      module. The calibration unit can perform a calibration process to normalize sensor deflections using a known deflection force in order to compensate for variations in sensors and the effects of the seat trim and foam. The weight estimation module can perform a weight estimation process that uses calibration data from the calibration process and sensor data from the sensors to translate sensor deflection due to a vehicle occupant into a
- 15      displacement value. The pattern module can look for traits in the pattern of sensor deflections that are common for objects other than people. Finally, the decision-making module can make a deployment state decision for the airbag by looking at displacement trends to evaluate occupant weight and movement, and by evaluating pattern information.